

Figure 1

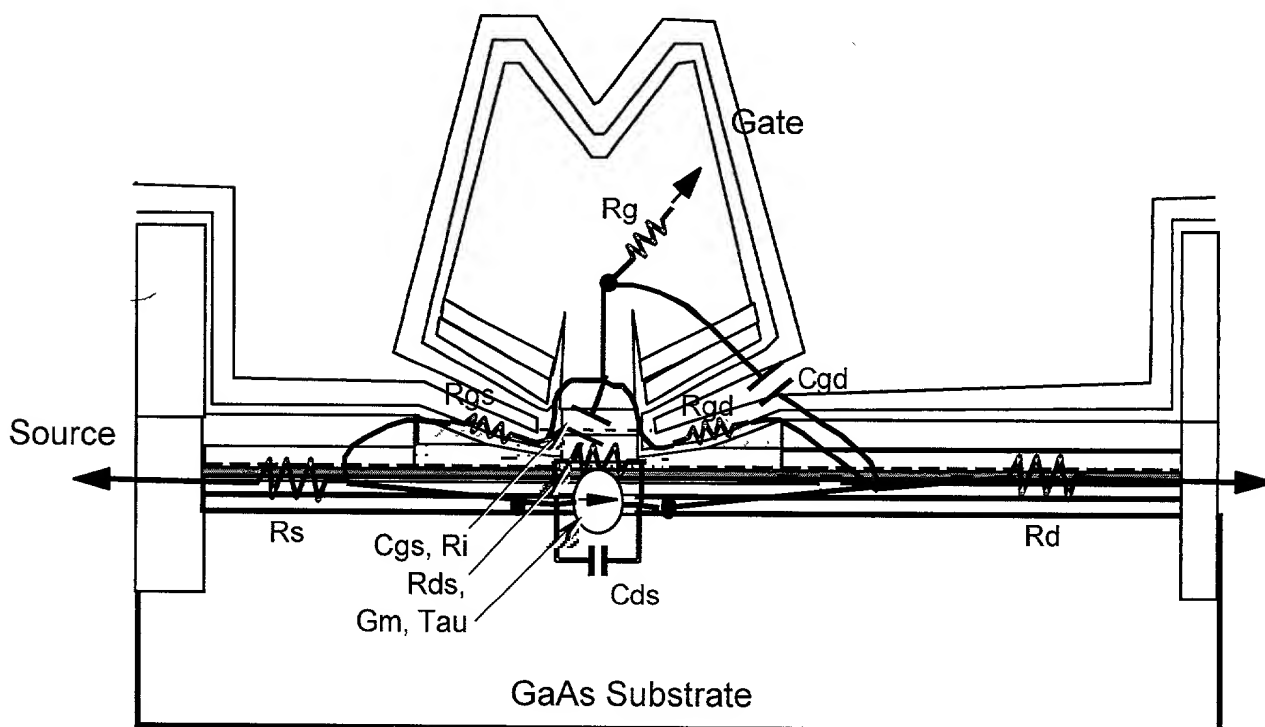


Figure 2

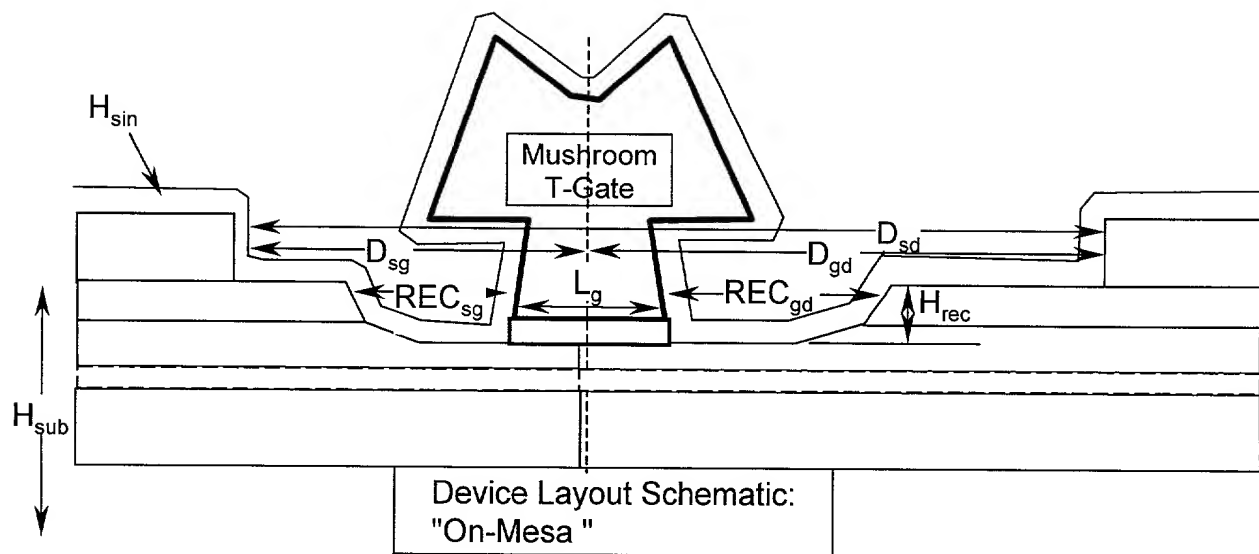


Figure 3

Single Recess Geometry

Ohmic Contacts		Recess Geometry	
Separation / um	wsd 2	Width / um	w .52
Source width / um	ws 10	Position / um	x .8
Drain width / um	wd 10	Depth / um	d .77E-07
		Angle / degrees	a 60
Schottky Contact		Inter-electrode Capacitances / fF	
Gate length / um	Lg .15	Cgsp	0.6
Gate position / um	xg .8	Cgdp	0.1
		Cdsp	43
		<input type="checkbox"/> Auto	

OK Reset Cancel

Figure 4

5.7 GaAs Substrate

Layer #	Material	Thickness (nm)	Resistivity (ohm-cm)
1	GaN	100	0.001
2	AlN	100	0.001
3	AlN	100	0.001
4	AlN	100	0.001
5	AlN	100	0.001
6	AlN	100	0.001
7	AlN	100	0.001
8	AlN	100	0.001
9	AlN	100	0.001
10	AlN	100	0.001
11	AlN	100	0.001
12	AlN	100	0.001
13	AlN	100	0.001
14	AlN	100	0.001
15	AlN	100	0.001
16	AlN	100	0.001
17	AlN	100	0.001
18	AlN	100	0.001
19	AlN	100	0.001
20	AlN	100	0.001
21	AlN	100	0.001
22	AlN	100	0.001
23	AlN	100	0.001
24	AlN	100	0.001
25	AlN	100	0.001
26	AlN	100	0.001
27	AlN	100	0.001
28	AlN	100	0.001
29	AlN	100	0.001
30	AlN	100	0.001
31	AlN	100	0.001
32	AlN	100	0.001
33	AlN	100	0.001
34	AlN	100	0.001
35	AlN	100	0.001
36	AlN	100	0.001
37	AlN	100	0.001
38	AlN	100	0.001
39	AlN	100	0.001
40	AlN	100	0.001
41	AlN	100	0.001
42	AlN	100	0.001
43	AlN	100	0.001
44	AlN	100	0.001
45	AlN	100	0.001
46	AlN	100	0.001
47	AlN	100	0.001
48	AlN	100	0.001
49	AlN	100	0.001
50	AlN	100	0.001
51	AlN	100	0.001
52	AlN	100	0.001
53	AlN	100	0.001
54	AlN	100	0.001
55	AlN	100	0.001
56	AlN	100	0.001
57	AlN	100	0.001
58	AlN	100	0.001
59	AlN	100	0.001
60	AlN	100	0.001
61	AlN	100	0.001
62	AlN	100	0.001
63	AlN	100	0.001
64	AlN	100	0.001
65	AlN	100	0.001
66	AlN	100	0.001
67	AlN	100	0.001
68	AlN	100	0.001
69	AlN	100	0.001
70	AlN	100	0.001
71	AlN	100	0.001
72	AlN	100	0.001
73	AlN	100	0.001
74	AlN	100	0.001
75	AlN	100	0.001
76	AlN	100	0.001
77	AlN	100	0.001
78	AlN	100	0.001
79	AlN	100	0.001
80	AlN	100	0.001
81	AlN	100	0.001
82	AlN	100	0.001
83	AlN	100	0.001
84	AlN	100	0.001
85	AlN	100	0.001
86	AlN	100	0.001
87	AlN	100	0.001
88	AlN	100	0.001
89	AlN	100	0.001
90	AlN	100	0.001
91	AlN	100	0.001
92	AlN	100	0.001

Figure 6

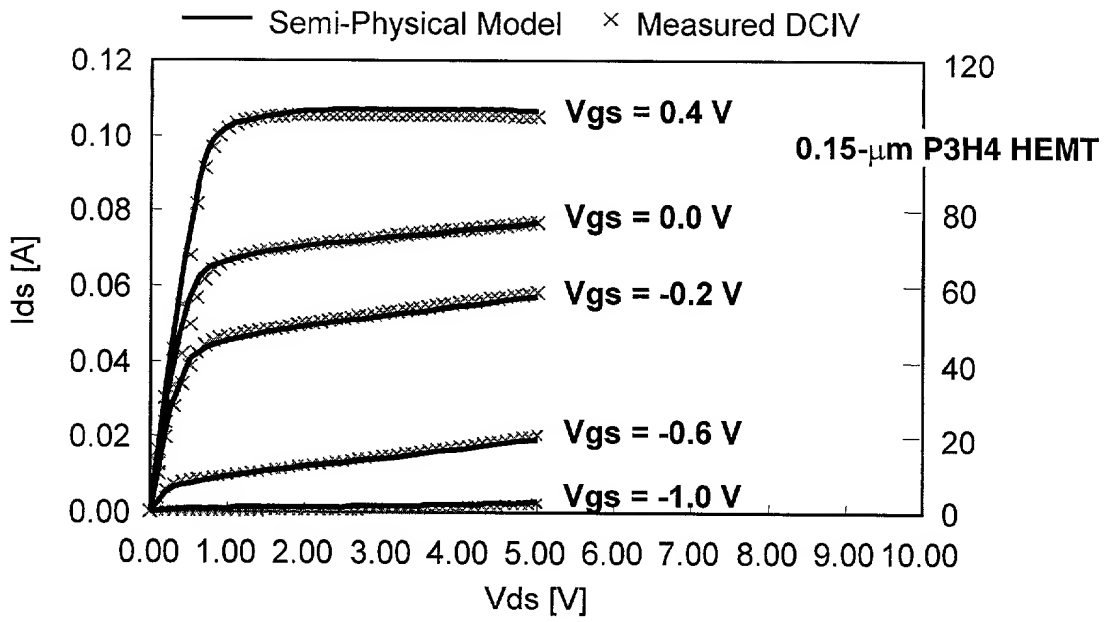


Figure 7

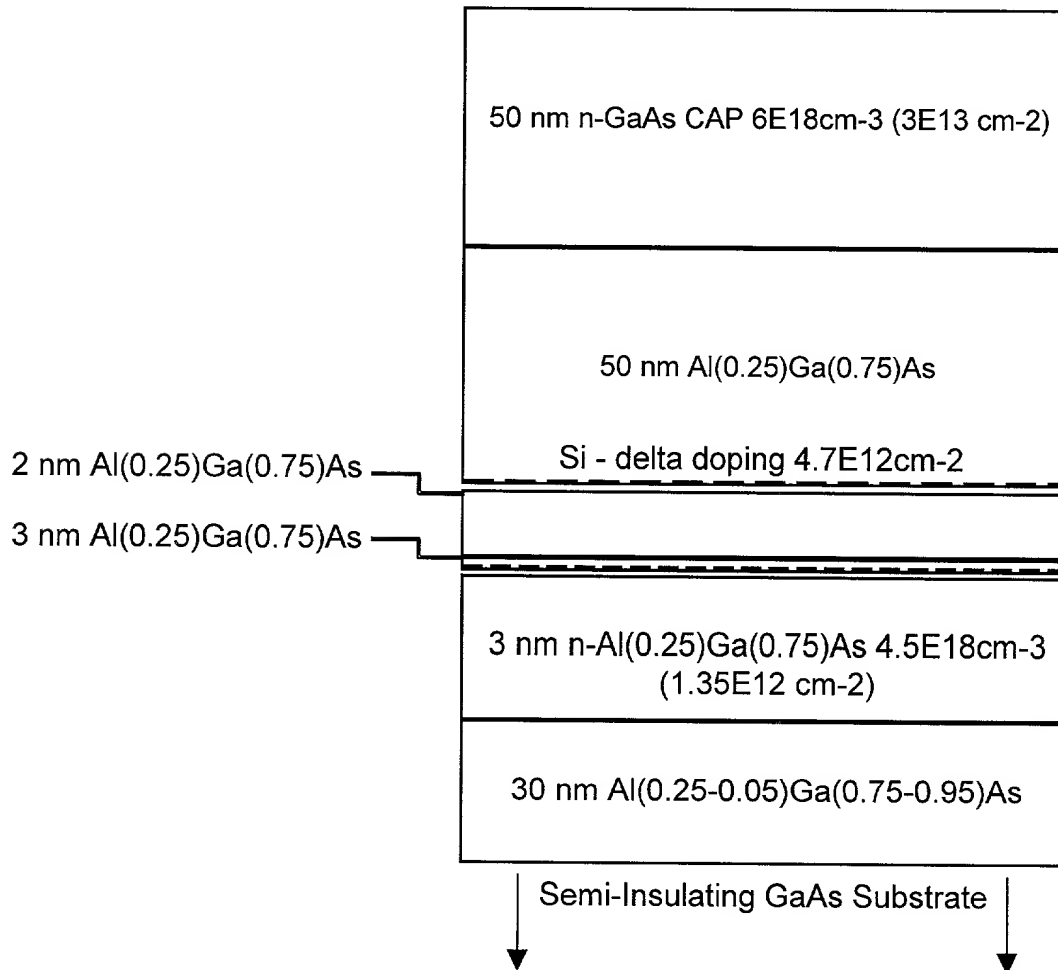


Figure 8

Mushroom T-Gate Schematic

Figure 10

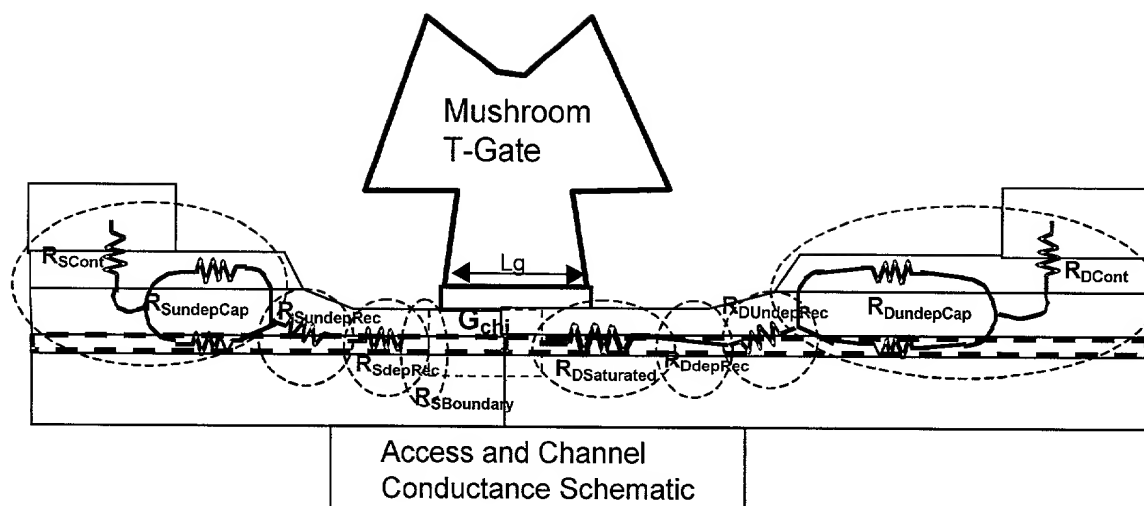
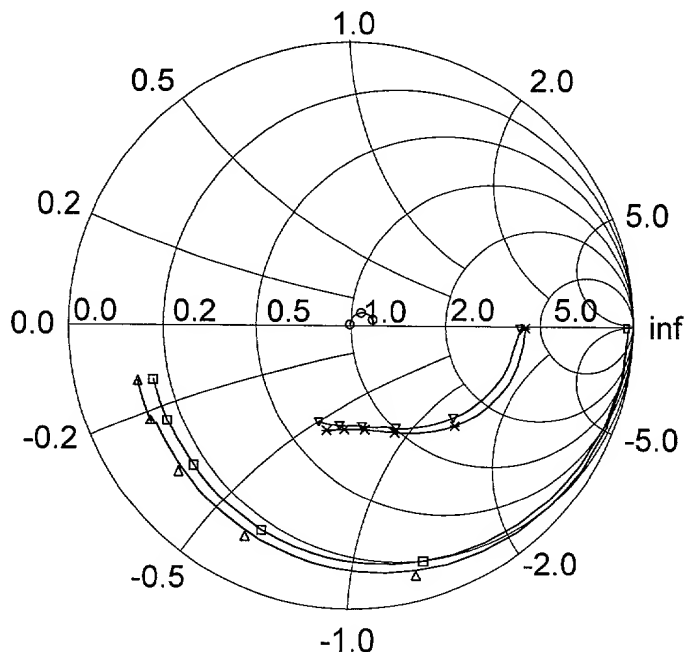


Figure 11

measure SMAT1 meas_4200AB_2vidpk-GTPA4 S[1,1]
 measure SMAT1 meas_4200AB_2vidpk-GTPA4 S[1,2]
 measure SMAT1 meas_4200AB_2vidpk-GTPA4 S[2,2]
 Simulated SMAT1 cp100-semiphys S[1,1]
 Simulated SMAT1 cp100-semiphys S[1,2]
 Simulated SMAT1 cp100-semiphys S[2,2]



Frequency 0.05 to 40.05 GHz

Measured vs Modeled S-parameters
 Simulated Equivalent Circuit Element Values
 via Semi-Physical HEMT Model

Figure 12

FOE240" 00504850

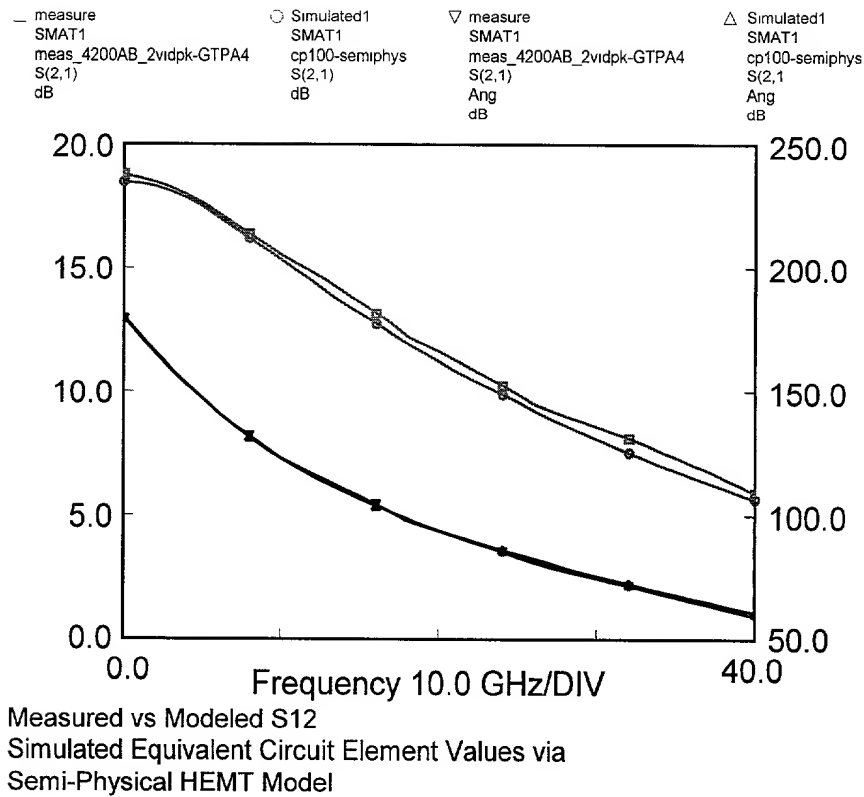


Figure 13

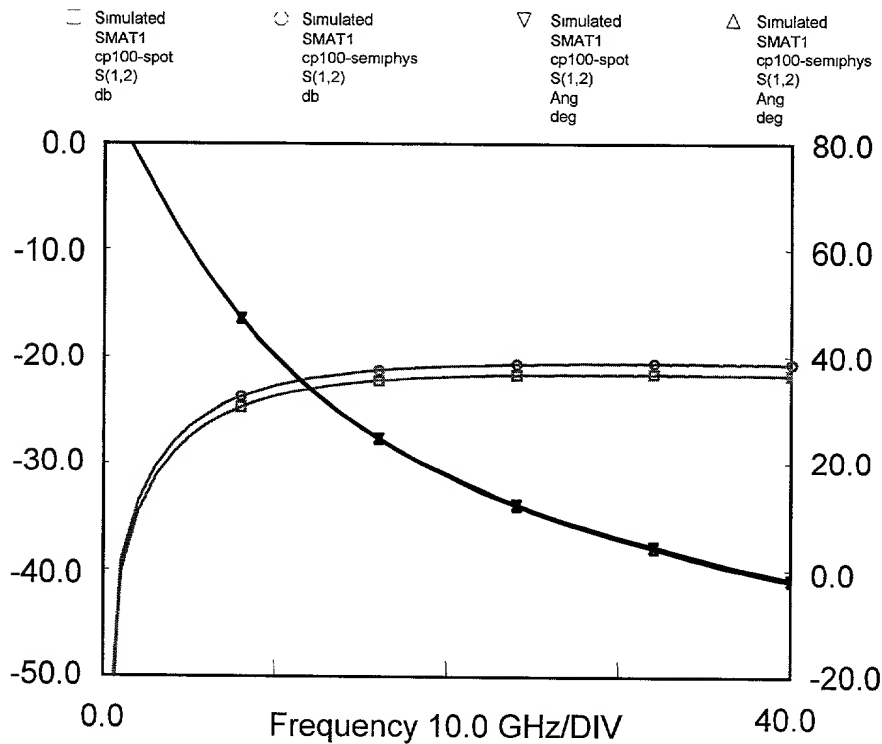


Figure 14

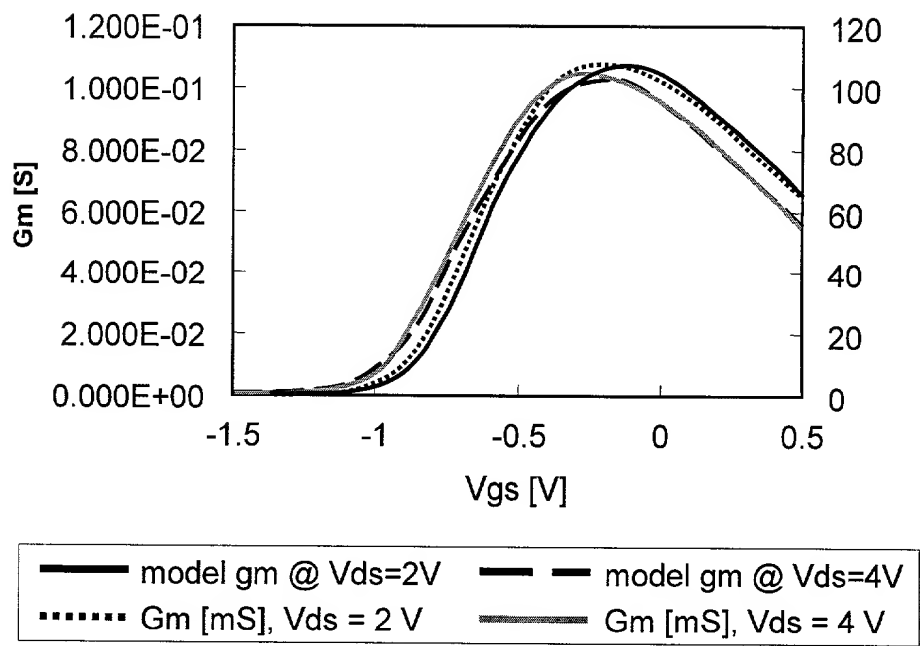


Figure 15

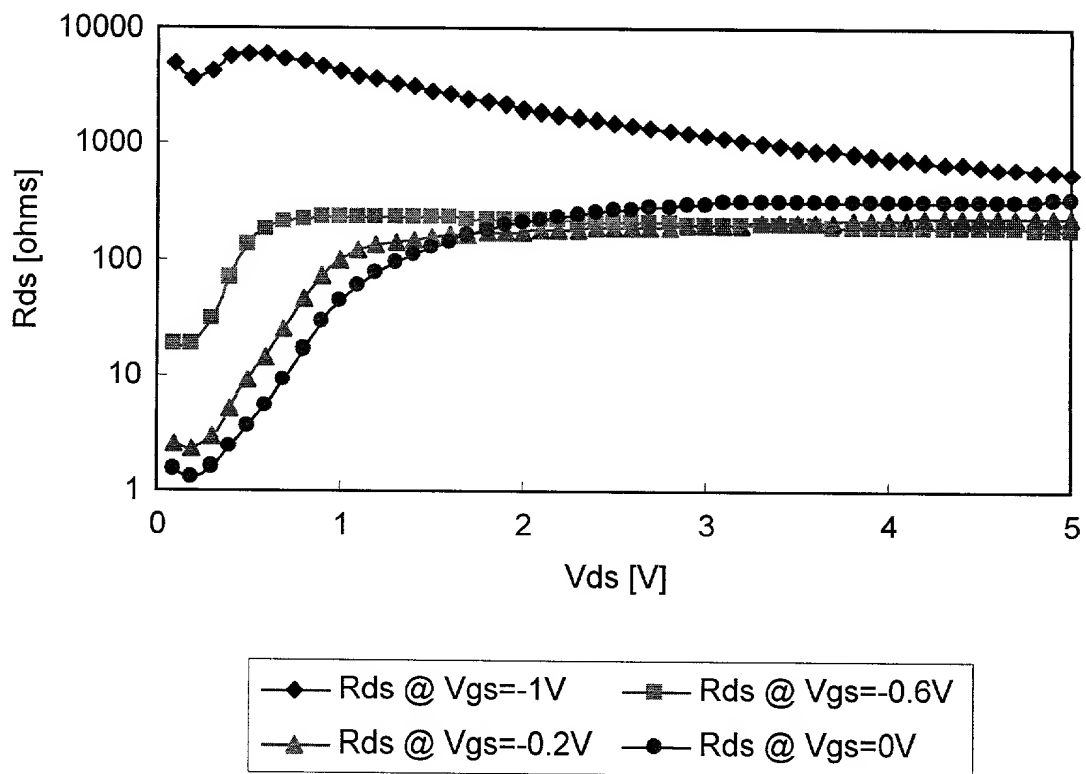


Figure 16

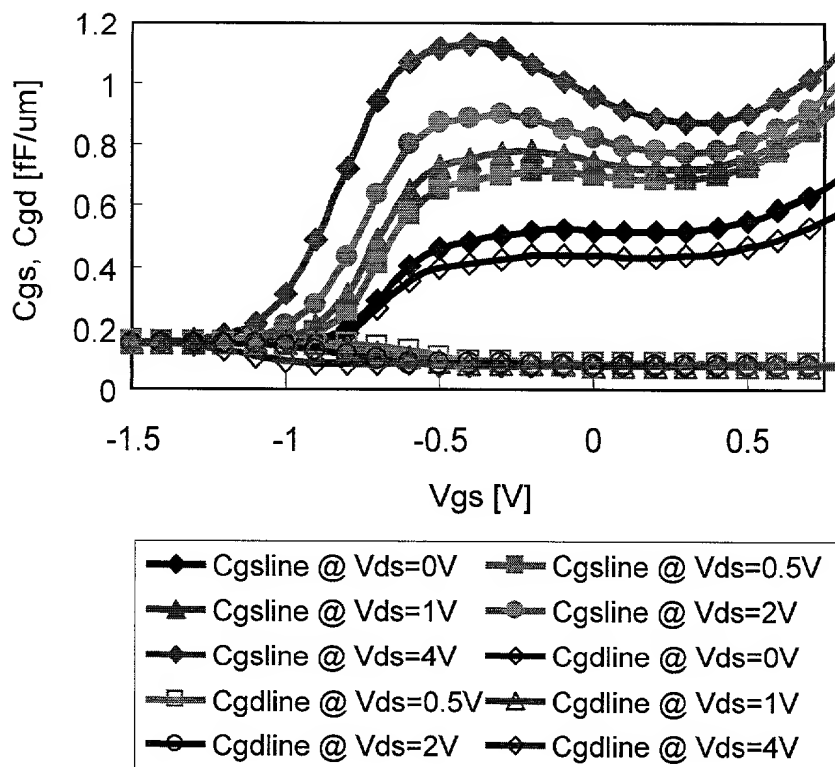


Figure 17

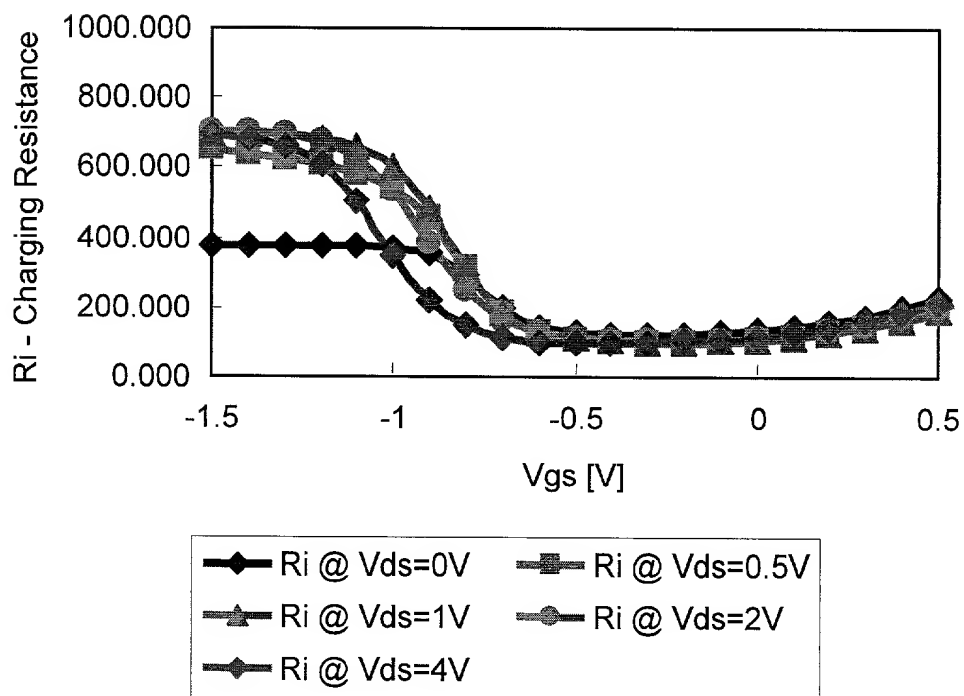


Figure 18

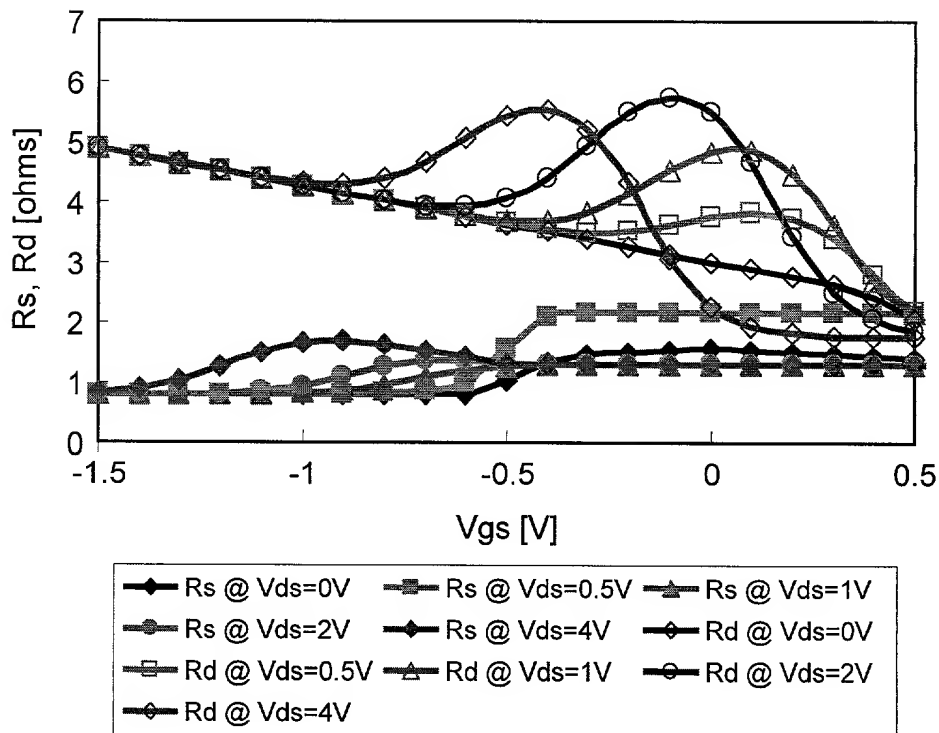


Figure 19

Measured vs Simulated Bias- Dependent Gain @ 23.5 GHz

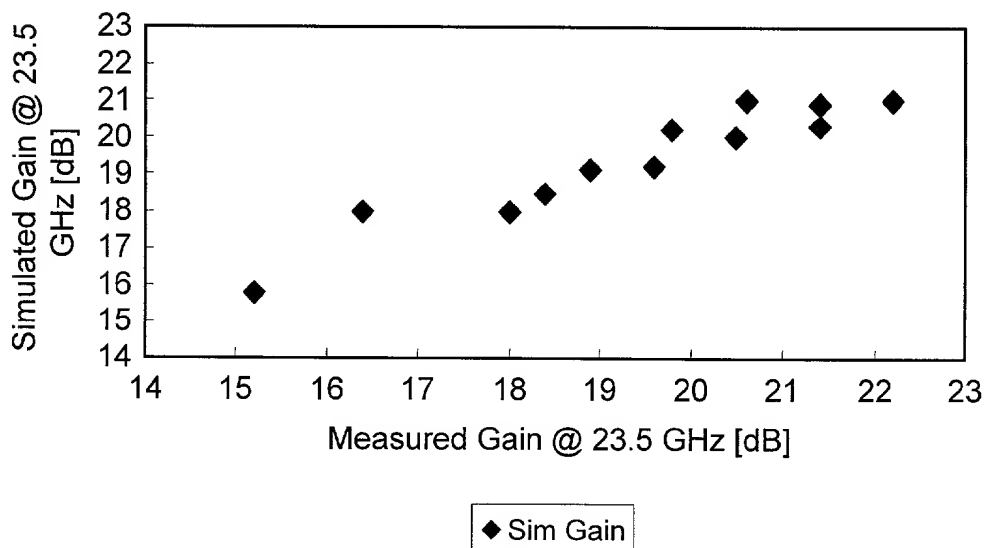


Figure 20

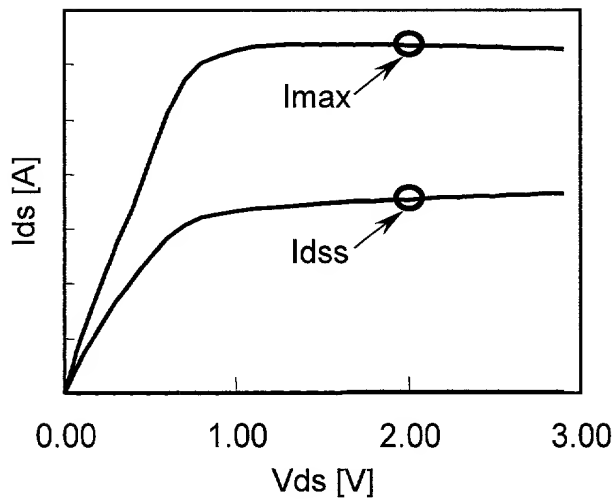


Figure 21A

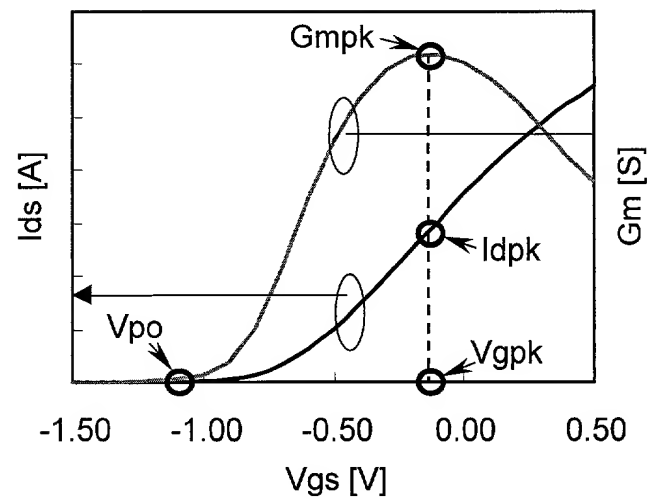


Figure 21B

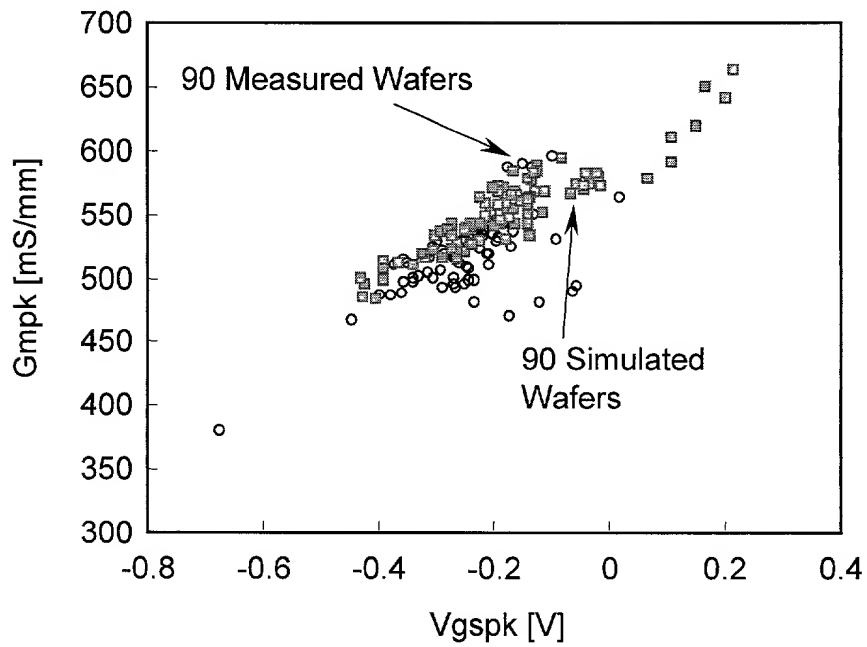


Figure 22

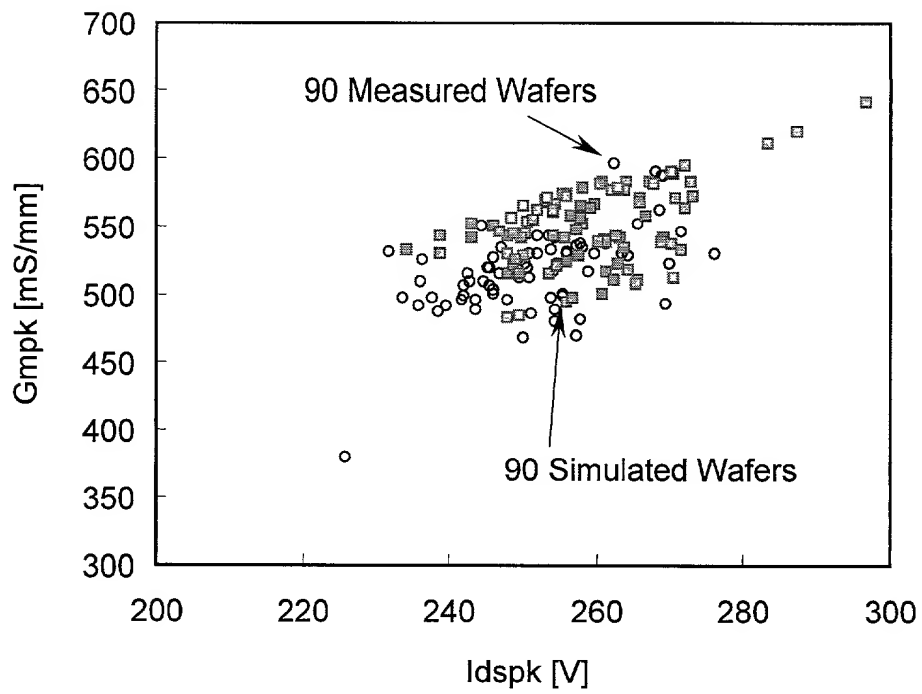


Figure 23

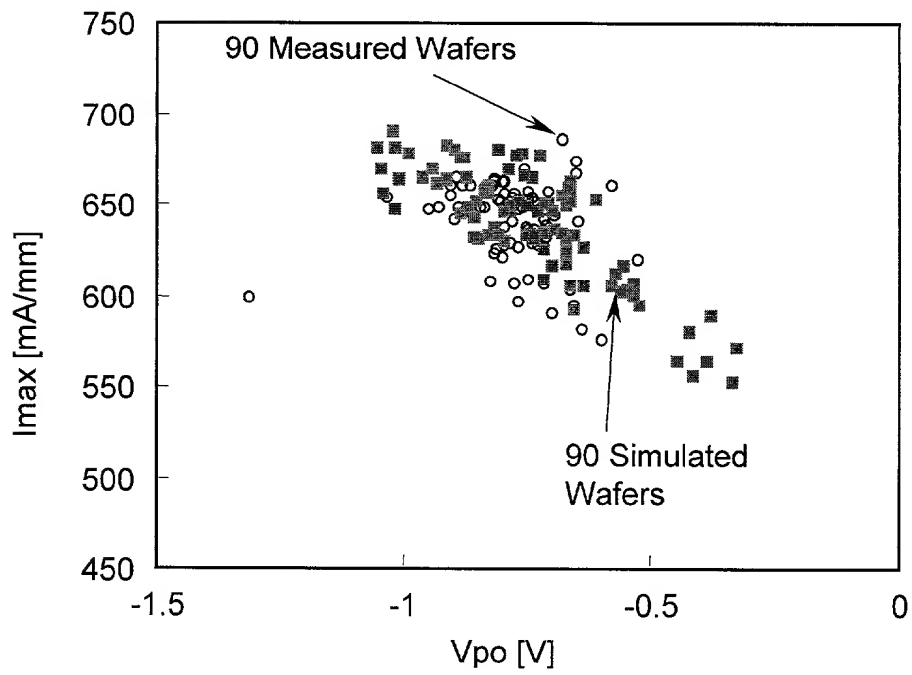


Figure 24

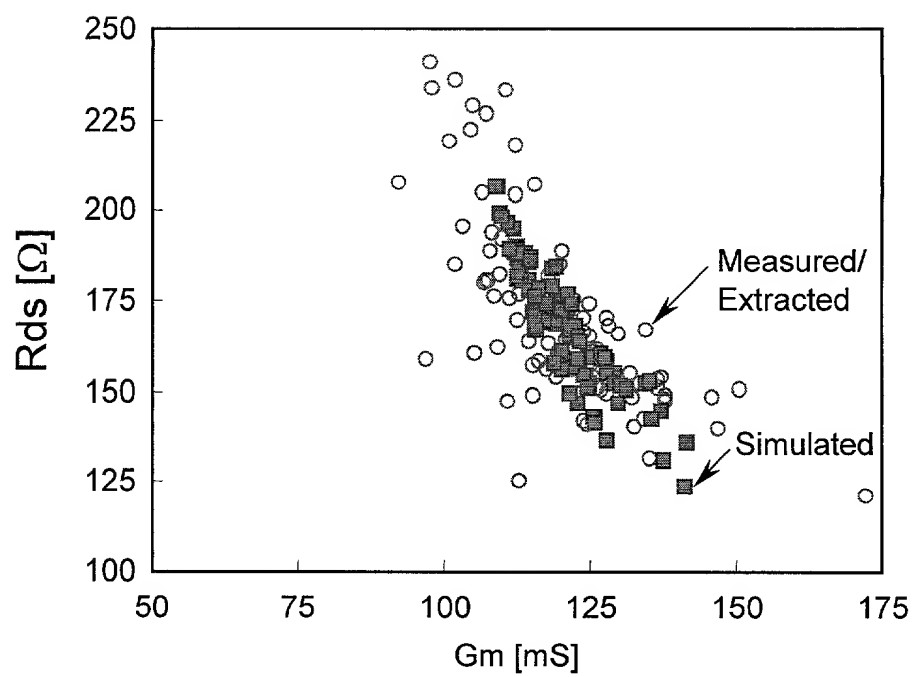


Figure 25

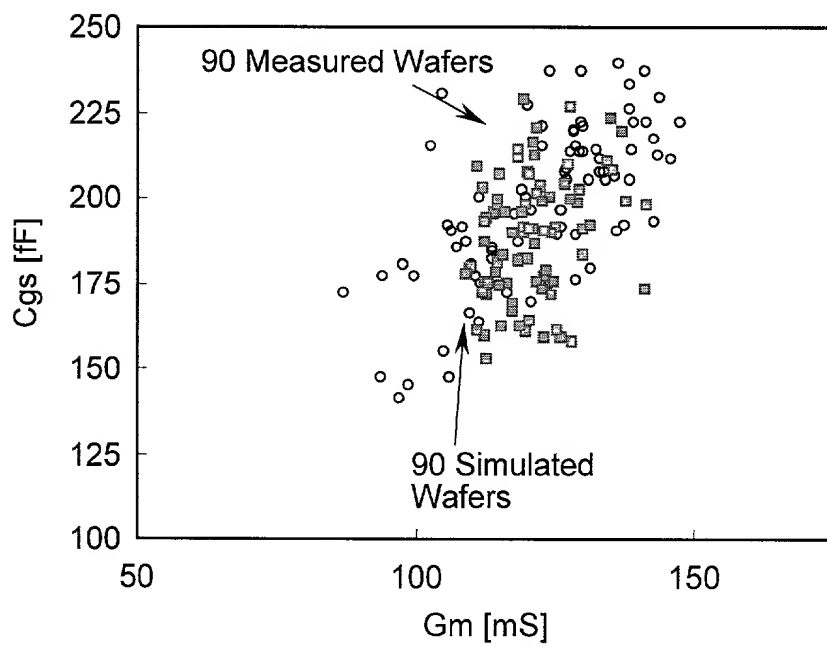


Figure 26

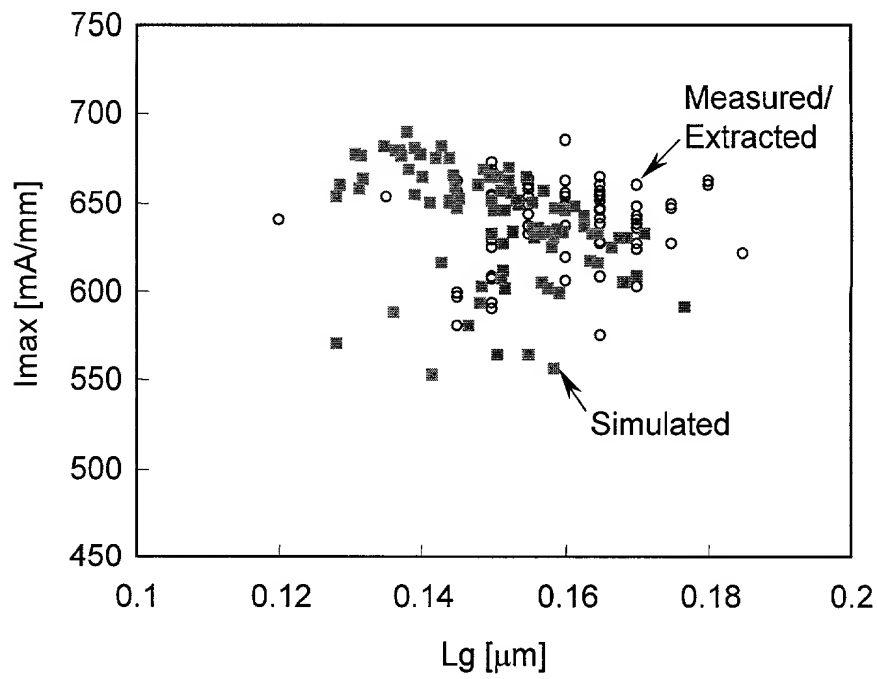


Figure 27

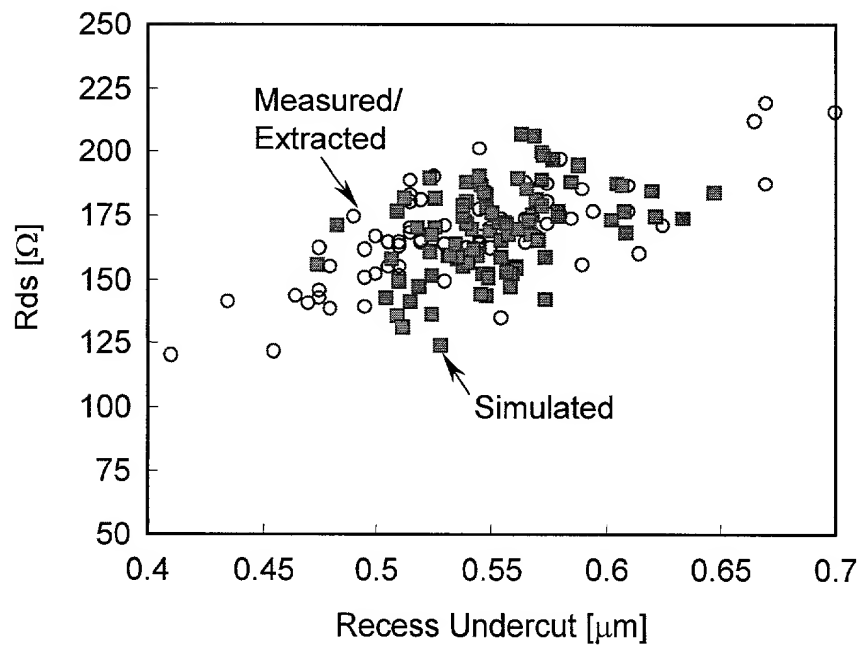


Figure 28